

Phytochemical Characterization of *Feronia Limonia* Leaves

GHUMARE PRAMILA¹, JIREKAR D. B¹, MAZAHAR FAROOQUI²
and NAIKWADE S. D³

¹Anandrao Dhonde Alias Babaji Mahavidyalaya,
Kada. Dist. Beed., INDIA.

²Rafiq Zakeria,
College for Women, Aurangabad, INDIA.

³Mrs. K. S. K. College,
Beed, INDIA.

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ABSTRACT

The present paper deals with the phytochemical analysis of *Feronia limonia* belongs to family Rutaceae, commonly known as kaitha or wood apple, widely used as an ethnomedicine in india. Chemical constituents of leaves extract are flavanoid, tannin, phenols. Present work explore phytochemical test, fluorescence analysis etc. Alcoholic and petroleum ether extract shows remarkable high value of ash and extractive value as compare to other extract.

Keywords: *feronia limonia*, tannin, ash value, phytochemicals, leaves extract, extractive value.

1. INTRODUCTION

Its leaves are commonly used as carminative, purgative, Bronchitis, Diarrhoea, Expectorant and cardiogenic. The juice of young leaves of *feronia limonia* is used for intestinal trouble of children. The fruit of *feronia limonia* are used for tumors, Asthma, wounds, cardiac, Debility and Hepatitis.

Feromia limonia belongs to family Rutaceae, is commonly known as kaith or

wood apple and is widely distributed in most tropical and subtropical countries.¹ The *feronia limonia* is native and common in India, Shrilanka, China and Indonesia.² *feronia limonia* as a whole or its parts such as unripened fruit, ripened fruit, root bark, trunk, gum and leaves have a broad spectrum of traditionally established therapeutic properties³ and widely used in several Ayurvedic preparation like panch kapittha⁴ and kapitthaashtaka churna⁵. Leaves of *feronia limonia* showed anthelmintic

activity⁶. The main chemical constituent of *feronia limonia* were flavonoids, saponins and tannin⁷⁻⁹.

Hence the present investigation is an attempt in this direction to evaluate physicochemical parameter along with phytochemical screening and fluorescence analysis of powdered crude drug.

2. MATERIAL AND METHOD

The fresh leaves of *feronia limonia* was collected from Mahadeo dara, district Beed. The fresh leaves were dried under shade, powdered and pass through 40 mesh sieve and stored in closed bottle for further use. The powder were extracted with different solvent ranging from non polar to polar solvent.

2. 1. Ash analysis

Ash value are helpful in determining the quality and purity of crude drug, is especially in powder form¹⁰.

2. 1. 1 Total ash

About 3gm of powdered leaves was accurately weighed and taken in a silica crucible, which was previously ignited and weighed. The powder was spread as a fine, even layer on the bottom of crucible. The crucible was incinerated gradually by increasing temperature to make it dull red hot until free from carbon. The crucible was cooled and weighed. The procedure was repeated to get constant weight¹¹.

2.1.2 Water soluble ash

The ash obtained as described in the determination of total ash was boiled for 5

minutes with 25 ml of water. The insoluble matter was collected on ashless filter paper and washed with hot water. The insoluble ash was transferred in to silica crucible, ignited for 15 minutes and weighed. The procedure was repeated to get constant weight. The weight of insoluble matter was subtracted from the weight of the total ash. The difference of weight was considered as water soluble ash¹¹⁻¹².

2.1.3 Acid insoluble ash

The above obtained ash was boiled with 25ml of 2N HCl for 5 minutes. The insoluble ash was collected on an ashless filter paper and was washed with hot water. The insoluble ash was transferred in to a silica crucible, ignited and weighed. The procedure was repeated to get constant weight¹² (Table 1)

Table 1: Ash analysis of *feronia limonia* leaves

Sr. no	Type of ash	Percentage(w/w)
1	Total ash	7.30%
2	Acid insoluble ash	2.10%
3	Water soluble ash	4.05%

2.2 Extractive value

Extractive value of crude drug are useful for their evaluation, especially when the constituents of a drug cannot be readily estimated by any others means. Further, these values indicates the nature of constituents present in crude drug¹³ (Table. 2)

2.3 Phytochemical analysis

The successive extract of water, ethanol, chloroform, acetone, petroleum ether were subjected to various chemical test for the identification of the phytoconstituents. (Table.3)

Table. 2 Percentage extractive value of *feronia limonia* leaves

Sr. no	Type of extractive value	Percentage(w/w)
1	Water	7.75%
2	Ethanol	5.10%
3	Chloroform	1.05%
4	Acetone	4.80%
5	Petroleum ether	1.35%

Table.3 Phytochemicals present in various extracts of *feronia limonia* leaves

Sr. no	Chemical constituents	Aqueous Extract	Ethanol Extract	Chloroform Extract	Acetone Extract	Petroleum ether Extract
1	Carbohydrate	-	+	-	-	-
2	Alkaloids	-	-	-	-	+
3	Glycosides	-	-	-	-	+
4	Saponins	+	+	-	-	-
5	Phytosterols	-	-	+	-	+
6	Phenols	-	+	+	+	+
7	Tanin	-	+	+	+	+
8	Flavanoids	-	+	+	-	+
9	Proteins & amino acid	+	+	-	-	-

Table. 4 Fluorescence analysis of *feronia limonia* leaves extract

Sr no.	Name of extract	UV		Visible
		254 nm	366 nm	
1	Aqueous extract	Brown	Dark Brown	Light Brown
2	Ethanol extract	Green	Brown	Yellowish Brown
3	Chloroform extract	Yellowish Brown	Yellow	Yellowish Brown
4	Acetone extract	Brown	Dark Brown	Light Brown
5	Petroleum ether extract	Yellowish Brown	Brown	Light brown

2.4 Fluorescence analysis

Fluorescence analysis of *feronia limonia* were observed under UV (254 & 366nm) and visible light¹⁴⁻¹⁵ with different solvent (Table. 4).

RESULT AND DISCUSSION

Phytochemical investigation provides the clue for further study of crude drug. The different extract of *feronia limonia* with different solvent shows presence of flavonoides, alkaloids, tannin, phytosterol, phenolic compound, saponins, protein and amino acid. Chemical parameter of *feronia limonia* leaves like ash value and extracting values of different solvent extract is shown in table no.1 & 2. Phytochemical analysis of *feronia limonia* leaves shows presence of alkaloid, flavonoid, tannin indicates significant properties which is shown in table no.3. Fluorescence analysis of *feronia limonia* leaves extract in different solvent is shown in table no.4. It is already used as carminative, purgative, bronchitis, astringent, expectorant and cardiotionic etc. Therefore *feronia limonia* required to further study for its medical applications.

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